mask; when regarded in profile, the appearance is equally striking. A framed picture, hung against a wall, appears as if imbedded in a cavity made in the wall. An object placed before the wall of a room appears behind the wall, and as if an aperture of the proper dimensions had been made to allow it to be seen; if the object be illuminated by a candle, its shadow appears as far before the object as it actually is behind it.

The communication concludes with a variety of details relating to the conditions on which these phenomena depend, and with a description of some other methods of producing the pseudoscopic appearances.

January 15, 1852.

COLONEL SABINE, V.P., and Treas., in the Chair.

A paper was read, entitled, "On the Development of the Ductless Glands of the Chick." By Henry Gray, Demonstrator of Anatomy at St. George's Hospital. Communicated by W. Bowman, Esq., F.R.S. Received November 12, 1851.

In this paper the author has demonstrated the evolution of the spleen, supra-renal and thyroid glands, and the tissues of which each is composed, in order to show the place that may be assigned to each in a classification of the glands.

The *spleen* is shown to arise between the 4th and 5th days, in a fold of membrane which connects the intestinal canal to the spine (the "intestinal lamina"), as a small whitish mass of blastema, perfectly distinct from both the stomach and pancreas. This fold serves to retain it and the pancreas in connection with the intestine. This separation of the spleen from the pancreas is more distinct at an early period of its evolution than later, as the increased growth of both organs causes them to approximate more closely, but not more intimately with one another; hence probably the statement of Arnold, that the spleen *arises* from the pancreas. With the increase in the growth of the organ and the surrounding parts, it gradually attains the position that it occupies in the full-grown bird, in more immediate proximity with the stomach; hence probably the statement of Bischoff, that it *arises* from the stomach. Later, when its vessels are formed, the membrane in which it was developed is almost completely absorbed.

The author then considers the development of the tissues of the spleen, which clearly establishes, not only the glandular nature of the organ itself, but the great similarity it bears with the supra-renal and thyroid glands.

The external capsule and the trabecular tissue of the spleen are both developed between the 8th and 9th days, the former in the form of a thin membrane composed of nucleated fibres, the latter consisting of similar fibres, which intersect the organ at first sparingly, and afterwards in greater quantity. The development of the blood-

vessels and the blood are next examined. The former are shown to arise in the organ independent of those which are exterior to it. The development of the blood-globules is shown to arise from the blastema of the organ at the earliest period of its evolution, and continue their formation until its connection with the general vascular system is effected, at which period their development ceases. No destruction of the blood-globules could ever be observed. These observations disprove the two existing opinions of the use of the spleen, as the blood-discs are not formed there (excepting during its early development), as stated by Gerlach and Schäffner; nor are they destroyed there, as stated by Kölliker and Ecker.

The development of the pulp tissue is next examined. At an early period this closely corresponds with the structure of the suprarenal and thyroid glands at the earliest stages of their evolution, consisting of nuclei, nucleated vesicles, and a fine granular plasma, the former forming a very considerable portion of its structure. When the splenic vessels are formed, many of these nuclei are surrounded by a quantity of fine dark granules arranged in a circular form, and these increase up to the time when the splenic vein is formed, when nearly the whole mass is composed of nucleated vesicles, the nuclei of which gradually break up into a mass of granules which fill the cavities of the vesicles. The Malpighian vesicles are developed in the pulp by the aggregation of nuclei into circular masses, around which a fine membrane soon appears, in a manner precisely similar to those of the suprarenal and thyroid glands, with which they bear the closest analogy.

The author then traces out the development of the supra-renal glands, and shows the close analogy that exists between them, the spleen, and thyroid, from the similarity which their structure presents at the earliest period of their evolution with those glands, and from the development of the several tissues following the same stages in all.

They are shown to arise on the 7th day as two separate masses of blastema, situated between the upper end of the Woolfian bodies and the sides of the aorta, being totally independent (as concerns their development) of those bodies, or of each other. At this period their minute structure bears a close resemblance to that of the spleen, consisting of the same elements as that gland, excepting in the existence of more numerous dark granules, which give to the organ at a later period an opake and darkly granular texture. The gland tissue of the organ, in the form of large vesicles, makes its appearance on the 8th day, whereas in the spleen it did not exist until near to the close of incubation, an interesting fact in connection with the function of the former gland, which is mainly exercised during fœtal life, whilst the spleen exerts its function mainly in adult life; hence the difference in the development of the tissues at different periods. The manner in which this tissue is developed is similar to that by which the gland tissue of the spleen was formed, viz. by an aggregation of nuclei into circular masses, around which a limitary membrane ultimately forms; these

are first grouped together in a mass, without any subdivision into cortical and medullary portions. On the 14th day the first trace of this subdivision becomes manifest, by the vesicles being aggregated into masses which radiate from the circumference towards the centre of the gland, in some cases complete tubes being formed by the junction of the vesicles, as indicated by hemispherical bulgings along their walls. At a later period the organs increase in size, they attain their usual position, and a more complete subdivision into cortical and medullary portions is now observed.

The author lastly traces out the development of the thyroid glands, and shows the great similarity that exists between them, the spleen and supra-renal glands, from the similar structure they present, and from the development of those structures occurring in a similar manner in each.

These glands are developed between the 6th and 7th days as two separate masses of blastema, one at each side of the root of the neck, close to the separation of the carotid and subclavian vessels, and between the trachea and the branchial clefts, but quite independent, as far as regards their development, of either of those parts. Their minute structure at an early period closely corresponds with that of the spleen and supra-renal glands. Later, when the gland tissue of which the thyroid gland ultimately consists is formed, it is developed in a manner precisely similar to the same tissues of the spleen and supra-renal glands, a fact which shows the analogy they bear to one another.

From these observations the author concludes that a close analogy exists between the glands already described, so that the propriety of their classification under one group, as the "Ductless Glands," may be considered clearly proved. And although the spleen by many has been excluded from them, the author considers that its classification with them is correct, for the following reasons:—1st. From its evolution being similar with that of the supra-renal and thyroid gland; 2nd. from its structure, which at an early period closely corresponds with them; and 3rdly, from the development of its tissues following the same law as that upon which the tissues of the allied glands are formed.

January 22, 1852.

DR. DAUBENY, V.P., in the Chair.

A paper was read, entitled:—"Researches on the Geometrical Properties of Elliptic Integrals." By the Rev. James Booth, LL.D., F.R.S. &c. Received November 17, 1851.

In this paper the author proposes to investigate the true geometrical basis of that entire class of algebraical expressions, known to mathematicians as elliptic functions or integrals. He sets out by showing what had already been done in this department of the subject by preceding geometers. That the elliptic integral of the